# Statement of Work

**Title:** *400 Area Substation Study*
**Revision Number:** *Rev 0*
**Date:** *9-19-16*

## 1.0 INTRODUCTION / BACKGROUND

MSA Electrical Utilities (Buyer) is responsible for the operation and maintenance of the Hanford Site transmission and distribution system, including the B5S4 (aka 451B) substation that serves the Hanford 400 area. Assuming D4 (Deactivation, Demolition, Decontamination, Decommissioning) efforts will begin in 2040 and conclude in 2045, there will be no need for power in the 400 area after 2045. In the meantime, Electrical Utilities will need to distribute power to the 400 area for at least the next thirty years. This poses the question if the aging infrastructure in the 400 area substation is reliable enough, or is the correct configuration for continued operation through 2045.

The work scope of this Statement of Work (SOW) is to develop viable options for providing electrical power to the loads served by the B5S4 substation through the conclusion of 400 Area D4 activities. This SOW will also conduct a lifecycle cost analysis of the options presented, and provide a best value recommended path forward for 400 Area electrical distribution from 2017 through 2045.

## 2.0 OBJECTIVE

Develop technically feasible, potentially time phased, options for future power delivery to the 400 Area through the conclusion of D4 activities. All viable options must meet DOE RL's mission needs as specified in the criteria listed in Section 3.0, with a recommended option based upon a weighted analysis of feasible options.

## 3.0 DESCRIPTION OF WORK – SPECIFIC

To complete the desired task, the subcontractor shall follow the boundaries listed below for a complete analysis. This study will assume the owner will have physical and operational control of the distribution system, until D4 is complete (with the exception of item 1.c. below):

1) At a minimum, analyze

    a) The lowest life cycle cost option for maintaining the existing configuration of B5S4. This encompasses the maintenance/upgrades of the substation transformers, circuit breakers, protective components as well as switchgear and its related components, and station service, as needed to support the Hanford mission in a reliable manner. The underground distribution system components should not need to be included in the scope, as they are run-to-failure components.

b) The technical feasibility of serving the B5S4 loads, minus LIGO (Laser Interferometer Gravitational-Wave Observatory), with a distribution line from a neighboring utility including a lifecycle cost analysis.

c) De-energizing the entire distribution system at the beginning of D4 activities and requiring the D4 contractor to self-power using generators. Include analysis of lifecycle cost for turning B5S4 and the distribution system over to a public utility (i.e. City of Richland, Benton REA etc.)

d) Bypassing the B5S4 substation to a stand-alone substation, which would serve the remaining loads through D4 Activities.

2) Electrical distribution support for LIGO may be terminated with a three year advanced notice.

3) B5S4 may be converted to a transmission line tap configuration.

4) Assume D4 will commence in 2040 and conclude in 2045. Once D4 activities are complete, it is assumed there will be no need for power in the 400 Area.

5) The 618-10 remediation site will no longer require power by the beginning of FY18.

6) Owner monitoring and control of all transmission and distribution assets by the 251W substation Dispatch Station is required, and thus included in the life cycle cost.

7) Voltage control at end point locations is limited to +/-5%.

8) Assume existing loads, and demand load for each, will remain constant until D4 activities begin.

Once options have been developed, the subcontractor will then calculate the power available for D4 operations for each option, assuming the 400 Area is emptied of operational loads. For new distribution line options where additional capacity may be purchased as part of the capital investment, the subcontractor will show the cost/benefit of purchasing additional capacity.

## 4.0 SUBMITTALS

See the Appendix A Submittal Register for details related to submittal format, type, review cycles, etc.

- Engineering work plan
- Employee Job Task Analyses (EJTA), as appropriate

- Subcontractor personnel training qualifications/documentation
- Overall Schedule
- 30% Engineering Alternatives Analysis
- 60% Engineering Alternatives Analysis
- 90% Engineering Alternatives Analysis for final review.
- 100% Final Engineering Alternatives Analysis (with recommendations) signed and releasable into Hanford Document Management Control System.

Submittals shall be provided to MSA Document Control using the MSA Contractor Document Submittal form (A-6003-061)

Requests for Clarification/Information may be provided to MSA Document Control using Request for Clarification or Information form (A-6003-063)

## 5.0 ACCEPTANCE CRITERIA

**The submittals and Engineering Alternative Analysis shall be reviewed by cognizant MSA Engineering staff to confirm the requirements of 3.0, 4.0 and the Master Submittal Register (MSR) have been met.**

## 6.0 CONFIGURATION MANAGEMENT

### 6.1 Documentation

**Technical Documents.** New or revised Technical Documents shall be prepared in accordance with the contractor's internal procedures. Appropriate editorial and presentation standards shall be employed. Technical documents received by MSA will be reviewed, approved, and issued using form A-6003-282 (Appendix B). The form will be initiated by the Seller and completed by the Buyer.

### 6.2 Reviews

Each product shall be checked, reviewed and approved internally by the Subcontractor prior to providing the package to MSA for review, comment, and subsequent approval. MSA considers 90% products to be ready for final issue.

The preparation, checking, verification, review, approval and release of all submittals and analysis media is included in this scope of work. MSA may conduct reviews on packages in accordance with internal MSA procedures and guides. MSA engineering may conduct

informal/formal interim reviews (e.g., 30% and 60%) as determined by the applicable MSA Design Authority/Engineer or Project Manager. The purpose of these MSA-conducted formal and/or informal reviews, if performed, is to monitor progress and should not be construed as submittal verification approval.

The Subcontractor shall submit an engineering work plan that includes a verification plan for all analyses. The plan will be submitted to MSA for review and approval. The verification plan shall describe the method of implementing and documenting reviews to the extent possible, understanding that the submittals have not yet been developed and refinement of the plan may be required as the submittals progress.

## 7.0 ESH& QA REQUIREMENTS

### 7.1 Environmental, Safety Health (ES&H) Requirements

The Subcontractor shall exercise a degree of care commensurate with the work and the associated hazards. The Subcontractor shall ensure that management of ES&H functions and activities is an integral and visible part of the Subcontractor's work planning and execution processes. The Subcontractor shall flow down applicable ES&H requirements to the lowest tier Subcontractor performing work on the Hanford site commensurate with the risk, complexity, and specific activity of the work.

Subcontractor and its lower-tier subcontractors shall be responsible to complete an Employee Job Task Analysis (EJTA) in accordance with MSC-PRO-11058, *Occupational Medical Qualification and Monitoring Using EJTA*, for any of the following situations:

- For any subcontractor employee who will be on the Hanford Site for more than 30 days in a year.
- For any subcontractor employee who may potentially be exposed to hazards (e.g. radiological, beryllium, hazardous wastes, noise) while performing in accordance with the subcontract statement of work.
- For any subcontractor employee enrolled in a medical or exposure monitoring program required by 10 CFR 851, and/or any other applicable federal, state or local regulation or other obligation.

If any of the above conditions are met, the subcontractor and its lower-tier subcontractor employee is to have a current approved EJTA prior to that employee beginning work on the Hanford Site.

Buyer's Safety and Health Procedures are available on the internet at http://www.hanford.gov/pmm/page.cfm/Construction. The documents on this site are kept current and are available for Subcontractors and lower-tier Subcontractor use.

**APPLICABLE ES&H REQUIREMENTS**

| | Number | Title |
|---|---|---|
| 1. | MSC-MP-003 | Integrated Environment, Safety, and Health Management System Description |

### 7.2 Quality Assurance (QA) Requirements

The Subcontractor shall have a Quality Assurance Program (QAP) and implementing procedures that utilizes a national or international voluntary consensus standard such as the American Society of Mechanical Engineers, NQA-1-2008, *Quality Assurance Requirements for Nuclear Facility Applications* (including 2009 Addenda), or Equivalent.

This procurement is a General Service, Quality Level 0 procurement activity.

### 7.3 Subcontractor Quality Assurance Program

The Subcontractor's Quality Assurance Program shall be subject to review by MSA at all times. When subcontracting any portion of this Subcontract, the Subcontractor is required to flowdown the applicable engineering and quality assurance program requirements to the subcontractor.

The Buyer reserves the right to verify the quality of work at the Subcontractor's facility, including any lower-tier subcontractor's facility. Access to a lower-tier subcontractor's facility shall be requested through the Subcontractor and may be performed jointly with the Subcontractor. All requests for site visits will be requested through the Buyer's Contracting Officer.

The Subcontractor shall, during the performance of this Contract, submit proposed changes to the quality assurance program to the Buyer for review prior to implementation.

### 7.4 Commercial Off the Shelf Software

The Subcontractor is being asked to provide the administrative submittals and an Engineering Alternatives Analysis document as defined in the MSR. No design media or calculations are anticipated to be required, therefore there is no need to provide for documentation for commercial-off-the-shelf (COTS) software[1]. Should any spreadsheet calculations be performed, they shall be verified by hand calculation and that verification documented.

[1] COTS software refers to an existing application which will be implemented on a standard operating system without the need for modification of its executable/object code.

### 7.5 Quality Assurance and Engineering Oversight

Subcontractor activities are subject to QA and Engineering oversight by the Buyer's quality assurance or engineering representative at the Subcontractor's' facility or the Subcontractor lower-tier's service provider(s). The Buyer shall be allowed access to these facilities for oversight activities with a reasonable notification to the Subcontractor. These oversight activities shall be coordinated through the Subcontractor's and Buyer's Contract representatives.

## 8.0 PERSONNEL REQUIREMENTS

### 8.1 Training

All personnel performing work on this task shall have the necessary training for access to the Hanford site and systems. The training required to support this work effort is listed below.

| | |
|---|---|
| 000001 | HGET – Computer-Based Training (CBT) |
| 110001 | MSA General Employee Training (MGET) - CBT |

CBT Training may be coordinated through Vivid Learning Systems, 372-0335.

### 8.2 Qualifications

Subcontractor personnel performing engineering services shall have, appropriate training, experience, qualification and/or certification(s) to perform the work required by this SOW. Documentation/certification of personnel qualifications shall be maintained by the Subcontractor and provided to MSA upon request. Subcontractor personnel qualifications/certifications will be verified by MSA prior to performing work in order to provide reasonable assurance that the Subcontractor has assigned personnel with sufficient documented training, education, and experience to satisfy the specified requirements. Subcontractor to provide personnel resume and evidence of qualification prior to being allowed to initiate work under this SOW.

It is expected that the Subcontractor will identify and apply an appropriate mix of resources and experience to each task to ensure that MSA is receiving the best value possible for the engineering services being requested.

### 8.3 Security and Badging Requirements

For any on site work, see Special Provisions – On Site Services for details.

Subcontractor employees will be required to submit to vehicle searches and not personally carry or transport certain prohibited articles.

### 8.4 Work Location/Potential Access Requirements

A majority of the work activities will be performed at the Subcontractor's facilities. Subcontractor may be required to make periodic visits to Hanford Site locations (i.e., 2490 Garlick Blvd, HAMMER, 200 East/West Area, 600 Area, etc.). MSA anticipates the Subcontractor will not access any radiological controlled areas for which additional radiological training is required.

Work schedules and facility operations are not consistent on the Hanford Site. MSA may require Subcontractor to perform services to support MSA alternate work schedules including shift work other than a standard 8x9 (with alternate Friday closures) or 4x10 work week. MSA will not be subject to any additional costs which result from Subcontractor's assignment or support of an alternate work schedule.

## 9.0 MEETINGS

Subcontractor shall participate in all meetings as requested by the Buyer's Technical Representative (BTR). The general purpose of meetings is for the coordination, control, and direction of the Work. In addition to meetings addressed by this Section, Subcontractor may be required by other Sections and other Subcontract documents to conduct special-purpose meetings and various safety meetings and briefings.

## 10.0 DELIVERABLES AND PERFORMANCE SCHEDULE REQUIREMENTS

### 10.1 Deliverables

All deliverables associated with this task release have been identified in Appendix A of this task release.

### 10.2 Schedule

Start Date: Within 2 Seller work days of award
Milestone #1: Approval of submittals 1-5 (SD + 56 calendar day)
Milestone #2: Approval of submittal 6 (SD + 91 calendar day)
Completion Date: Within 133 days of Start Date

## 11.0 SPECIAL REQUIREMENTS

### 11.1 Communication with Hanford Site Regulatory Agencies

Under no circumstances shall the subcontractor interact directly with regulatory agencies prior to notifying and obtaining the concurrence of the Contract Specialist and the Buyer's Technical Representative.

# APPENDIX A
# SUBMITTAL REGISTER

**Submittal Register Definitions**

1. Numerical submittal sequence number: Example: 1, 2, 3, 4 (or organized by topics and project assigned coding structure).

2. Number of Copies and electronic and/or hard copy: Example: E (Electronic only), 6 (Six Hard Copies), or Hard, 1: E, 1 (One Hard Copy, and Electronic).

3. Format: Describes the type of submittal required:

| | |
|---|---|
| **DWG** | An AutoCAD drawing using the Hanford standard formatting (See HNF-14660, *Off-Site Subcontractor Directions for the Preparation and Control of Engineering Drawings)*. |
| **MFC** | Microsoft Format Compatible application (Word, Excel, Access, PowerPoint) |
| **P3** | A Primavera Project Planner schedule |
| **GEN** | General or Open Format/Media |
| **PDF** | Adobe Acrobat (Portable Document Format) |

4. Submittal Type:

**APW** = Approval Required Prior to Work (Buyer must approve the Subcontractor's submittal prior to the Subcontractor being authorized to proceed with any activity/work associated with the submittal).

**AP** = Approval Required (Buyer must approve the Subcontractor's submittal, however, work associated with the submittal may proceed prior to Buyer approval).

**FIO** = For Information Only (the submittal is not subject to review and/or approval).

5. **Vendor Information: Mark Yes if document(s) are VI, otherwise leave blank.**

6. Description / Document Title: Title or general description of the document.

7. Submittal Date: Actual date or number of Calendar Days before or after a milestone that a submittal is due from the Subcontractor: Example: June 1, 2005 or CD + 60 [60 days after Conceptual Design Complete]

**A** Date of Award

| | |
|---|---|
| **CD** | Conceptual Design Complete |
| **PD** | Preliminary Design Complete |
| **FD** | Final Design Complete |
| **M** | Mobilization |
| **SC** | Start of Construction |
| **SD** | Start Date |
| **EC** | End of Construction |

8. Buyer Review Time (Work Days): Example: 3 Days

9. Subcontract Reference: Cross reference to the Subcontract requirement that defines this submittal: Example: SOW 3.1.2.

10. Reviewers: List of reviewers for each submittal. Listing is not provided on SOW copy provided for proposals

**Submittal Register:**

**The Subcontractor shall meet the required schedule and provide the documents specified in accordance with the following submittals.**

| Subcontract Number and Name: | | | | | | Revision: | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1. No. | 2. No. of Copies* (See End Note) | 3. Format | 4. Type | 5. Vendor Information – Mark Yes if VI, Otherwise Leave Blank | 6. Description / Document Title | 7. Submittal Date (Calendar Days) | 8. Buyer Review Time (Work Days) | 9. Subcontract Paragraph or Requirement Reference | 10. Reviewers |
| 1 | 1 | MFC or PDF | APW | | Engineering Work Plan | SD+7 | 4 | 4.0 | |
| 2 | 1 | MFC or PDF | APW | | Employee Job Task Analyses (EJTA), as appropriate, or a document that supports why no EJTA is needed. | SD+7 | 2 | 4.0 | |
| 3 | 1 | MFC or PDF | APW | | Subcontractor personnel training qualifications/documentation | SD+7 | 4 | 8.0 | |
| 4 | 1 | MFC or PDF | AP | | Overall Schedule | SD+7 | 4 | 4.0 | |
| 5 | 1 | MFC and PDF | APW | | 30% Engineering Alternatives Analysis | SD+42 | 8 | 4.0 | |
| 6 | 1 | MFC and PDF | APW | | 60% Engineering Analysis with recommendations | SD+77 | 8 | 4.0 | |
| 7 | 1 | MFC and PDF | APW | | 90% Engineering Analysis with recommendations | SD+105 | 8 | 4.0 | |
| 8 | 1 | MFC or PDF | APW | | Final 100% Engineering Analysis | SD+133 | 8 | 4.0 | |

***For electronic submittals, the number of hard copies can be negotiated with the Contract Specialist and approved by the BTR**

# APPENDIX B

## Engineering Document Change Form

ECR-___-_____ Page 1 of 1

# EDC (ENGINEERING DOCUMENT CHANGE) FORM

## Document Identification

1. Change Title:

8. Release: Release CACN

2. Project No./Work Package No.:

3. Review Designators:

N/A ☐ D ☐ P ☐ E ☐ N ☐ R ☐ I ☐ F ☐ Q ☐

Additional Reviewers:

___ ☐ ___ ☐ ___ ☐ ___ ☐ ___ ☐ ___ ☐

| 4. Area | 5. Building | 6. Facility | 7. System No. |
|---|---|---|---|
| | | | |

9. USQ Required? ◯ USQ ◯ CX ◯ NA No.: _____

| 10. Distribution - Name | MSIN | Distribution - Name | MSIN |
|---|---|---|---|
| | | | |

11. Change Description (description and reason for requested change):

## Approvals

| 12. Change Originator | *TA/DA* | *Engineering Management/TA Manager* |
|---|---|---|
| Print/Signature/Date | *Print/Signature/Date* | *Print/Signature/Date* |
| Title | Title | Title |
| Print/Signature/Date | Print/Signature/Date | Print/Signature/Date |

13. Document Index

| Action | Number | Title | Rev (being issued) | Change Page(s) | Config Baseline |
|---|---|---|---|---|---|
| | | | | | ☐ |

14. Potentially Affected Documents Not Modified By This EDC:

| Document Type | Document Number/Revision | Document Owner (Organization) | Technical Authority Notified | Date Notified |
|---|---|---|---|---|
| | | | | |

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## EDC FORM COMPLETION INSTRUCTIONS

All fields must contain an entry. If entry into a field is not applicable, enter NA.

| Field Number | Required Action |
|---|---|
| Header | Obtain a number for the EDC from the IRM Document Control Station. Enter the number on the EDC form. |
| 1 | List the Title that describes the document being issued or change being made. |
| 2 | If there is one, list the Project Number and/or associated Work Package Number(s); if not, enter NA. |
| 3 | The TA/DA will indicate the appropriate Review Designators per MSC-PRO-8635 and any other Project/facility specific procedures.<br>Check the N/A box if no functional reviews are required per MSC-PRO-8635 or any other Project specific procedure. The TA/DA and Engineering Management/TA Manager signatures are still required even if N/A is checked. |
| 4 | List the Area that is affected by the document. |
| 5 | List the Building that is affected by the document. |
| 6 | List the Facility that is affected by this document. |
| 7 | List the System Number that is affected by the document. |
| 8 | The Document Control station will provide their official stamp in this field once the document has received all the appropriate signatures.<br>Document Control may enter the appropriate Contract/Charge Number onto the Release CACN line. |
| 9 | Check the appropriate box for USQ, CX, or N/A. As applicable, enter the determination number, the Categorical Exclusion Number, or N/A (typically only for non-nuclear facilities). |
| 10 | Enter the names and MSIN of persons on distribution for the EDC. |
| 11 | Provide text that describes the proposed change and the reason that the change is being proposed. |
| 12 | The Change Originator, TA/DA, and Engineering Management/TA Manager provide the final Approval Signatures in these fields. The Change Originator, TA/DA and Engineering Management/TA Manager sign next to their printed/typed name and the date of their signature to document their approval of the EDC. The TA/DA and Engineering Management/TA Manager signatures are required for ALL EDCs.<br>If the Change Originator and TA/DA is the same person, the TA/DA need only sign in the TA/DA block.<br>The TA/DA signature signifies that the following are accurate and complete:<br>- Document contents are technically accurate<br>- EDC and document have been prepared in accordance with HNF-PRO-440<br>- Review Designators are appropriately selected<br>- Review signatures reflect review designator requirements<br>The Engineering Management/TA Manager signature signifies:<br>- EDC Form is properly filled out<br>- Review Designators are appropriately selected<br>- Review signatures reflect review designator requirements<br>Additional review signatures are obtained based on the Review Designators specified in Field 3. Each reviewer signature is placed next to their typed/printed name. Telecon and/or e-mail approvals are so noted. The EDC Originator enters the authorizing name(s), date of approval, and method of approval (e.g., per telecon, per e-mail) in the appropriate EDC approval block, and identifies himself or herself as the one who obtained the approval. The telecon/e-mail approvals need not be replaced at a later date with the approver's signatures. For e-mail, attach a copy of the approval e-mail to the EDC Form. |
| 13 | List the documents that are approved, released, changed or cancelled by this EDC. Indicate in the Action column which of the following actions is being performed by the EDC for each item listed in the Document Index:<br>- New (N). The EDC issues a new text document into the DMCS.<br>- Direct Revision (DR). This EDC summarizes the change description and authorizes the text document revision. The revised text document provides the details for the change. Summaries of change descriptions do not apply to EDCs for classified documents. These changes are incorporated directly on the documents.<br>- Page Change (PC). This EDC is a variation of the direct revision. The EDC summarizes the change description, but only the affected page(s) of the text document are changed instead of revising the entire document.<br>- Supersedure (S). This EDC supersedes another EDC.<br>- Cancel (C). This EDC cancels another EDC. |

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## EDC FORM COMPLETION INSTRUCTIONS (Continued)

| Field Number | Required Action |
|---|---|
| 13 | (continued)<br>Fill in the number and title of the document being issued. Fill in the new revision number of the document being issued. For a "Page Change," enter the pages being changed; for other Actions, leave this field blank.<br>If the document is a part of the facility/Project Configuration Baseline, check the Configuration Baseline box; if the document is not a part of the configuration Baseline, no entry is needed in this field.<br>Press F3 while the cursor is in the field to recall pull-down lists. |
| 14 | Enter information about documents that might be affected by the EDC. Completion of these fields is not required, but is encouraged. Enter NA into each of the form fields that do not contain information. Information included in this field will assist the Technical Authority for documents affected by this EDC in preparing for modifications to the affected documents. |